

CLAIMS:

1. A downhole deflector tool for selectively opening and closing a lateral borehole extending from a primary borehole, the downhole tool comprising a body incorporating a wall provided with an opening extending therethrough; a deflector member slidably mounted in the body and having a deflecting surface for deflecting, in use, downhole equipment laterally within the body, the deflector member being slidable between an open position, in which the deflecting surface is located adjacent and facing towards said opening so that, in use, downhole equipment laterally deflected by the deflecting surface is directed through said opening, and a closed position, in which the deflecting surface is oriented relative to said opening so as to prevent downhole equipment from being laterally deflected through said opening during use; and constraining means for restricting movement of the deflector member relative to the body.
2. A downhole tool as claimed in claim 1, wherein the constraining means comprises a pin and groove arrangement.
3. A downhole tool as claimed in claim 2, wherein at least one pin is secured to one of the body and deflector member for locating in the groove defined in the other of the body and deflector member.
4. A downhole tool as claimed in claim 2 or 3, wherein the pin and groove arrangement is such that the deflector member must move axially between two different closed positions before being able to move axially to the open position.
5. A downhole tool as claimed in any of the preceding claims, wherein the constraining means comprises a shoulder defined by the body and against which the deflector member abuts when in the open position.
6. A downhole tool as claimed in any of the preceding claims, comprising means for allowing axial movement of the deflector member by the action of fluid pressure.
7. A downhole tool as claimed in any of the preceding claims, wherein a bore extends axially through the deflector member.

8. A downhole tool as claimed in claim 7, wherein the bore extending axially through the deflector member comprises first and second portions, the first portion having a larger diameter than the second portion.
9. A downhole tool as claimed in claim 8, wherein the deflecting surface is defined on that portion of the deflector member reducing the diameter of the bore through the deflector member.
10. A downhole tool as claimed in any of claims 7 to 9, wherein sealing means are provided between the body and deflector member so that, when in the closed position, fluid located exteriorly of the body is prevented from flowing into the bore of the deflector member.
11. A downhole tool as claimed in claim 10, wherein said sealing means comprises seals mounted on the deflector member and axially spaced from one another so as to be locatable beyond each axial end of said opening.
12. A downhole tool as claimed in any of the preceding claims, wherein, in the closed position, the deflecting surface of the deflector member faces diametrically away from said opening.
13. A downhole tool as claimed in any of the preceding claims, wherein, in the closed position, said opening is completely covered by the deflector member.
14. A downhole tool as claimed in any of the preceding claims, wherein, in the closed position, the deflecting surface is axially spaced from said opening.
15. A downhole tool as claimed in any of the preceding claims depending on Claim 7 wherein the wall of said tool body defines an axially extending bore in which the deflector member is slidably mounted.
16. A method of using a downhole deflector tool according to any of the preceding claims, the method comprising the steps of running said tool down a primary borehole, aligning said opening of said tool body with a lateral borehole extending from said primary borehole, and selectively moving said deflector member between said open and

closed positions.

17. A method as claimed in claim 16, wherein said step of moving said deflector member comprises the step of applying a fluid pressure to hydraulic actuation means connected to said deflector member.

18. A method as claimed in claim 17, wherein said step of moving said deflector member comprises the step of engaging said deflector member with a further tool and manipulating said deflector member with said further tool.

19. A downhole deflector tool as claimed in Claim 15 and a downhole manipulation tool comprising a generally cylindrical body having a bore axially extending therethrough and a vent aperture laterally extending therethrough so as to allow fluid communication between the bore of the manipulation tool and the exterior thereof; the manipulation tool further comprising a piston movable within the bore of the manipulation tool between a first position, in which the vent aperture is closed, and a second position, in which the vent aperture is open and the bore of the manipulation tool is blocked so that, in use, all fluid flowing through the bore of the manipulation tool is directed through the vent aperture.

20. Apparatus as claimed in Claim 19, wherein the body of the manipulation tool is provided with means for connecting the manipulation tool to the deflector member of said downhole deflector tool.

21. Apparatus as claimed in Claim 20, wherein the bore of the deflector member is provided with a circumferential groove and the body of the manipulation tool is provided with a collet for engaging with said circumferential groove.

22. A downhole tool as claimed in any of Claims 19 to 21, wherein sealing means is provided for preventing a flow of fluid between the body of the manipulation tool and said downhole deflector tool when, in use, said tools are connected to one another.

23. A downhole tool as claimed in any of Claims 19 to 22, wherein biasing means are provided in the manipulation tool for biasing said piston towards the first position.

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24. A method of using the apparatus of any of Claims 19 to 23, the method comprising the steps of running the downhole deflector tool down a primary borehole, aligning said opening of the body of the downhole deflector tool with a lateral borehole extending from said primary borehole, running the downhole manipulation tool down said primary borehole, and applying fluid pressure to the manipulation tool so as to move the piston of the manipulation tool from the first position to the second position whilst the body of the manipulation tool is engaged with the deflector member of the downhole deflector tool.

25. A method as claimed in Claim 24, wherein the downhole manipulation tool is run down said primary borehole whilst engaged with the downhole deflector tool.

26. A method as claimed in Claim 24 or 25, wherein, when the piston of the manipulation tool is in the second position, sufficient fluid pressure is generated in the bore of the manipulation tool and exteriorly of the manipulation tool to move downhole the manipulation tool and the deflector member engaged therewith.

27. A method as claimed in Claim 26, further comprising the step of picking up the manipulation tool and moving uphole the manipulation tool and the deflector member engaged therewith.

28. A method as claimed in any of Claims 24 to 27, wherein, before applying fluid pressure, a second lateral borehole extending from said primary borehole at a location uphole of the first lateral borehole is sealed against an ingress of fluid from said primary borehole.

29. A method as claimed in Claim 28, wherein the step of sealing said second lateral borehole comprises the method as claimed in any of Claims 16 to 18 or any of Claims 24 to 27.

30. A downhole deflector member comprising a cylinder having a window provided in a side thereof and having a ramp defined on an interior surface thereof for deflecting, in use, downhole equipment through said window; wherein a bore extends longitudinally through the deflector member so as to allow, in use, a passage of downhole equipment

through the deflector member without deflection by said ramp; and wherein a portion of said bore located uphole of said ramp has a larger diameter than the remainder of said bore.

31. A downhole deflector member as claimed in Claim 30, wherein said remainder of said bore is located both uphole and downhole of said portion of said bore.

32. A method of using the deflector member as claimed in Claim 30 or 31, the method comprising the step of running an expandable head tool downhole into the deflector member; expanding said tool so as to increase the diameter thereof and thereby prevent passage of said tool through the remainder of said bore; and pressing said tool downhole so that said tool is deflected by said ramp.